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INTERNET WEB SITE WITH AUDIO INTERCONNECT AND AUTOMATIC CALL DISTRIBUTOR

Field of the Invention

The field of the invention relates to the Internet and more particularly to audio interconnects through the Internet.

Background of the Invention

Automatic call distribution systems are known. Such systems are typically used in an organizational context as a means of distributing telephone calls among a group of agents of the organization.

Often the organization disseminates a single telephone number to its customers and to the public in general as a means of contacting the organization. As calls are directed to the organization from the public switch telephone network (PSTN), the automatic call distribution system directs the calls to its agents based upon some algorithm, typically based upon availability. For example, where all agents are considered equal, the ACD may distribute the calls based upon which agent position (telephone) has been idle the longest.   Alternatively, call distribution may be based upon a level of skill of an agent or by the source of the call.

In order to distribute incoming calls from the PSTN to the available agents, the interaction of a controlling computer with a switching fabric of the ACD becomes essential. Often a connection to a local PSTN is in the form of a number of trunk connections. Each of the trunk connections is monitored by the controller for incoming calls. Where a call is detected, the controller searches for and selects an idle agent. Upon

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selecting an agent, the controller instructs the switch to form a connection between the incoming trunk and selected agent.

In more complicated systems, the organization may use a number of telephone numbers to identify different individuals and functions within the organization. Each telephone number may be assigned to a particular incoming trunk or group of incoming trunk lines. As such, the controller may be required to recognize a call target based upon an identity of an incoming trunk line and route the call accordingly.

In other systems, the ACD of an organization may receive calls directed to different call targets over the same trunk lines. In such a case, the call target may be identified to the ACD by a pulse code modulated (PCM) signal transferred from the PSTN to the controller of the ACD by a dialed number identification service (DNIS) operating from within the PSTN.

In systems associated with service organizations, where many calls are received and handled by many agents, it may be important for an agent to have ready access to customer files. In such a situation, a database is maintained of existing customers. Customer records may be displayed on agent terminals as the agents converse with specific customers. In some cases, the customer may be identified to the database for display of records on the terminal by the agent entering a customer identifier into a keyboard associated with the terminal. Alternatively, the controller of the ACD may transfer an identifier of the customer to the database based upon an automatic number identification (ANI) facility, operating from within the PSTN.

Where ANI is used, the controller of the ACD receives the ANI digits (identifying the caller via the caller's telephone number) at the same time the call arrives from the PSTN. Upon selecting an agent, the controller may transfer the call to a

queue for the selected agent or directly to the selected agent. At the same time that the call is delivered to the agent, the controller sends an identifier of the selected agent and ANI number of the customer to a controller of the database (the

5   host). The host, in turn, displays the customer records via a computer monitor of the selected agent at the same time the call is delivered.

As a further feature, calls may be transferred among agents. Where a first agent finds that he or she cannot help a particular

10   customer, the agent may activate a key on a keyboard of the agent and enter an identity of another agent or agent group that may be better able to help the customer. The controller of the ACD may immediately connect the call to the newly identified agent, or may place the call in a queue until the identified agent becomes

15   available.

In either case, the controller transfers a message to the host identifying the previous and newly identified agent. Since the host knows the identity of the customer displayed at the terminal of the previous agent, the host may now display those

20   same customer records at the terminal of the newly selected agent.

Where a call is placed in a queue, the ACD controller may monitor a total time that the call has been in the queue. Where the time exceeds a threshold value, the controller may transfer

25   (overflow) the call to a newly selected agent at another less heavily loaded ACD (overflow ACD) within the same organization. The controller of the transferring ACD transfers DNIS and ANI information as well as a call sequence number assigned by the transferring ACD to the overflow ACD. The overflow ACD, upon

30   receiving the call, transfers the information to the host including an identifier that the call is an overflow call.

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With regard to geographical layout of an ACD system, often the switches of the ACD system are relatively widely distributed with small groups of agents assigned to each switch. Further, the switches may be in different time zones which offers the

5   opportunity of load sharing where agents may be used to share an incoming call load of a particular region based upon time of day or other factors.

While ACDs and agents of the organization are effective sales tools, an agent's time is often spent repeating the same

10   message to different customers and entering the same types information into a organizational database from different customers. To complement the efforts of sales agents and reduce the time an agent may spend explaining a product, most organizations invest heavily in printed sales literature and

15   marketing brochures.

As an alternative to printed matter, some organizations have begun providing web sites on the Internet, offering a wide variety of information. For many of those organizations, the Internet has become an effective marketing tool. Many

20   organizations now offer web sites providing customers with a wide variety of product information. However, if a customer has a question, he must still call a customer service representative (or send E-mail). Accordingly, a need exists for a method of providing interactive sales support to customers through web

25   sites of the Internet.

Brief Description of the Drawings

FIG. 1 is a block diagram of an Internet system and an Internet web site and call distributor in accordance with an

30   embodiment of the invention; and

FIG. 2 depicts a series of web pages of an embodiment of the web site of FIG. 1.

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Summary of the Invention

An apparatus and method of establishing an audio call path between an Internet user accessing a web site and an agent of the web site is provided. The method includes the steps of proving a web site with a plurality of audio access icons and a plurality of agent groups and associating an agent group of the plurality of agent groups with each audio-access icon of the web site. The method further includes establishing a voice path between the user and an agent of the associated agent group based upon activation of a audio-access icon by the user.

Detailed Description of an Embodiment

FIG. 1 is a block diagram of an Internet automatic call distributor (IACD) 20 of an organization, generally, in accordance with an illustrated embodiment of the invention. Under the embodiment, the IACD 20 provides Internet information through a web site 22 to any of a number of users (not shown) through a corresponding number of user terminals (e.g., terminal 10). The web site 22 also functions to set up voice connections between users (e.g., at terminal 10) and selected agent terminals 34, 38.

To support web searching and the receipt of audio/visual information, the user terminal 10 may be equipped with an appropriate web browser from a web browser supplier (e.g., America OnLine, Inc. (AOL)). To support voice traffic through the Internet between the user terminal 10 and the agent terminals 34, 38, both the agent terminals 34, 38 and user terminals 10 are provided with one or more internet protocol (IP) sockets (e.g., WebPhone from NetSpeak Corp., InterNet Phone from Vocal Tec, Inc., etc.) providing IP telephony.

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The IACD 20 may operate on a bridge or local area network (LAN) distributing Internet user calls among agents 34, 38 under the control of an ACD application 24. The ACD application 24 determines an identity of an agent 34, 38 to which a call is to be distributed. A router 30 functions to deliver the call to the appropriate agent 34, 38 through a hub 32, 40.

The router 30 and hubs 32, 40 operate conventionally. Upon receiving a packet of information, the router examines a packet header to determine a destination of the packet. Upon recovering the packet header, the router 30 upon reference to a look-up table may determine a route necessary to deliver the packet to the proper destination. The router 30 then routes the packet accordingly.

Each agent terminal 34, 38 functions as a web site on the Internet. Forwarding of the user from the original web site 22 to an agent 34, 38 is accomplished by regarding a help request from the user as an additional search term. The context of the help request causes an ACD application of the original web site 22 to route the user to a particular agent 34, 38.

Information about a user may be delivered to the terminal 34, 38 concurrently with the call. It should be understood that the term "call", as used herein, is not meant in its usual telephony sense to imply a continuous end-to-end connection. As used herein, call simply means that each party to the call has in its possession the Internet address of the other party to the call and is using that address to exchange audio information with the other party.

An agent may identify itself to the web site 22 at the beginning of a work shift by an appropriate sign-on message, including a personal identification number (PIN) of the agent. The terminal 34, 38 used by the agent sends the packet to the web site 22 announcing sign-on of the agent. The packet includes the

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LAN address 34, 38 of the agent and also the agent PIN. Upon
receipt of the sign-on message, the web site 22 associates the
previously known skill set of the agent with the PIN. When the
web site 22 determines that a call should be assigned to the

5   agent, the web site 22 retrieves the LAN address of the agent and
routes the call to that address.

The web site 22 may be interconnected with the Internet
through any of a number of hardwired integrated services digital
network (ISDN) connections. The web site 22 while shown as a

10   separate block on FIG. 1 may actually be made up of and include a
number of software applications operating on a general purpose
computer (e.g., an IBM PC). For example, the web site 22 may be
supported by an automatic call distributor (ACD) 24, report
generation software (REP) 26 and a number of maintenance and

15   support applications (MAINT) 28.

Under the embodiment, the visual aspects of web site 22
perceived by the user (not shown) through the terminal 10 are
conventional. A user may gain access to the web site 22 by
accessing the Internet 12 through a computer 10 with the

20   appropriate software and a subscription to the Internet through
an Internet service provider (e.g., AOL). The user may do a word
search or if he knows the Internet address of the organization
may access the web site 22 directly.

Where the user does a word search, he may first access a

25   search engine on the Internet (e.g., Yahoo, Web Crawler, etc.).
After a search, an Internet address of the web site 22 may be
returned as a search result.

Once the user accesses the web site 22, the user may arrive
at a home page 50 (FIG. 2). On the home page 50, the user may

30   find text 64 describing the organization and the organization's
products. The user may also be presented with a number of
softkeys 56, 58, 60, 62. Some of the softkeys (e.g., 56, 58, 60)

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may be labeled as directories to more detailed information of specific products or product lines. For example, activation of one of the keys (e.g., the first key 56 from the left) may lead to presentation of the second web page 52 to the user.

5   Activation of another key 58 may lead to presentation of the third web page 54.

Other softkeys (e.g., 70, 72) may be provided as a means of collecting information from the user. For example the organization may be an airline and the web site 22 may be
10   provided for the purchase of airline tickets. An interactive window 68 may be provided for entry of a flight destination.

To use the interactive window 68, the user may click on the window 68 with a mouse (not shown) of the terminal 10. Clicking on the window 68 may cause a cursor to appear in the window 68.
15   The cursor may allow the user to enter a desired destination into the window 68. To complete the request, the user may click on another softkey 74 to request ticketing information about the entered destination.

In response, the WEB application 22 may return ticketing
20   information in the same window 52 or similar window. The WEB application 22 may also open a file for the user in the database 44 based upon the Internet address of the terminal 10. The ticketing information returned to the user in the window 52 may include flight times and ticket pricing information. If a flight
25   does not fly to the entered destination, the text 82 may provide alternate destinations. In response, the user may be asked to click on a particular flight to select the flight and click on another softkey 78 to select ticket purchase.

In response, the WEB application 22 may present the user
30   with another screen 54, asking for a mode of payment. If the user selects a credit card, the user will be asked to identify

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the particular type of card and enter the credit card number through another window 66 to complete the transaction.

The user may select a particular type of card by pressing another softkey (e.g., 80). Activation of a particular softkey 80 may cause the cursor to appear in the window 66 along with text requesting entry of a credit card number. The user may enter his credit card number and complete the transaction by activation of another softkey 76. The user's file in the database 44 is updated accordingly.

At least one of the keys (e.g., 62) on at least some of the web pages 50, 52, 54 may be a help key labeled "Customer Service". The label "Customer Service may be provided as an indication that activation of the softkey will lead to direct access to, and a voice connection with an agent 34, 38 through the voice plug-ins of the Internet.

Upon activation of a Customer Service key, the WEB application 22 stores an identifier of the web page from which the Customer Service Key was activated in the user file in the database 44. The ACD application 24 then begins taking steps to determine the identity of the appropriate agent or agent group to connect to the user. For example, if the key 62 on the second screen 52 had been activated before selection of a destination, then the application 24 would know that the user has a question on flight destinations. On the other hand, if the user had clicked on the Service button 62 on the second screen 52 after entering a destination and after display of ticket price, then the application 24 would know that the user probably has a question on ticket pricing. If the user had clicked on the Service button 62 on the third screen 54, then the application 24 may surmise that the user has a question of credit card use.

Upon determining the type of problem to be addressed, the application 24 may turn to the problem of selecting an agent or

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agent group 34, 38 best able to address the problem. For instance, the ACD application 24 may determine from a skills list that a first agent 34 is best suited to answering the call from the user. However, the agent 34 may be occupied in servicing a

5   prior call. Where the selected agent 34 is occupied with a prior call, the application 24 may place the request in a call queue until the agent 34 becomes available.

While the user is in the queue, the user terminal 10 may give visual indication to the user that the request is being

10   processed. For instance, the terminal 10 may display the message "Please wait for the next available agent".

When the agent 34 becomes available, the application 24 transfers the user to the agent 34. Transfer of the user to the agent 34 may occur under either of two possible scenarios.

15   First, the web site 22 may transfer the Internet address of agent 34, to the user terminal 10. Under this scenario, the user terminal 10 would then transmit an audio set-up message allowing the user terminal 10 to set up the voice connection.

Alternatively, the web site 22 may transfer the Internet

20   address of the user terminal 10 to the selected agent 34. Sending the user address to the agent 34 would allow the agent 34 to defer set-up of the connection until the agent 34 has received any records of the user.

Upon transfer of the call to the agent 34, a home page of

25   the user may appear on the agent's screen. A home page of the agent (or the organization, or customer service) may also appear on the user terminal 10. Alternatively, the web page displayed on the user terminal 10 may remain constant and be displayed at both terminals 10, 34, allowing the user to ask questions without

30   being distracted by more information.

In addition to setting up the audio connection between the user and agent 34, the application 24 also transfers a file

forwarding request to a controller 45 of the database 44, including the Internet address of the user along with an identifier of the selected agent 34. The database then locates the user file and transfers the collected information to the

5   agent 34 in the form of a screen-pop. The screen-pop may occur over only a portion of the screen or may be presented in a flashing format to allow the agent to clearly see the information presented for the benefit of the user.

The screen pop may include any information collected from

10   the user and also an identifier of the web page where the problem occurred. Transferring information to the agent 34 regarding where in the problem occurred allows the agent 34 to view the same web page viewed by the user where the problem occurred. Further, the transfer of the collected information to the agent

15   34 allows the agent 34 to complete the transaction directly or to answer the user's question and allow the user to hit the "back" key on his Internet screen and return to the previous web page 22.

In another embodiment of the invention, the ACD application

20   24 maintains records on a time that a user has been in a queue waiting for the next available agent. If the time exceeds a threshold, the ACD application 24 may transfer the call to another queue of another agent or agent group 38.

In another embodiment, where an agent (e.g., the first agent

25   34) finds that he cannot adequately help the user, the agent 34 may enter an identifier of another agent 38 and activate a transfer key. The result may be a transfer of the user to a second agent 38.

In another illustrated embodiment of the invention (FIG. 1),

30   a user 18 may gain access to the Internet through the public switch telephone network (PSTN) 16 and an Internet Gateway 14. Under the embodiment, the user device 18 would include a modem

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and computer to generate the coding sequences necessary to access the web site 22.

In another embodiment, the user uses the touch-tone buttons of his telephone 18 to gain access to the base site 22. The user enters a telephone number into the telephone 18 that dials the Internet Gateway. The Internet Gateway routes the call through the Internet accordingly.

Upon responding, the web site 22 presents options to the user using a voice synthesizer and voice plug-in at the web site 22 and presents a number in association with the option. A second voice plug-in located within the Internet Gateway 14 converts the internet messages back to audio. The user selects an option by using the touch-tone buttons on his telephone 18 to select an option.

Where the user needs help, the user selects the help option. The call is, in turn, transferred to an agent 34, 38 based upon the criteria discussed above.

A specific embodiment of a method and apparatus of providing an audio interconnect and automatic call distributor on the Internet according to the present invention has been described for the purpose of illustrating the manner in which the invention is made and used. It should be understood that the implementation of other variations and modifications of the invention and its various aspects will be apparent to one skilled in the art, and that the invention is not limited by the specific embodiments described. Therefore, it is contemplated to cover the present invention any and all modifications, variations, or equivalents that fall within the true spirit and scope of the basic underlying principles disclosed and claimed herein.